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1. The Heinrich-Hertz Institute for Oscillation Research in Berlin-Adlershof has the following departments: 1/

I. Department of Electro-Acoustics, headed by Engineer Karl Feik, a former Telefunken technician. He works with about ten engineers and technicians. The Department is at present engaged in the development of **directional** microphones (Richtmikrophone) and in work concerning sound propagation along the common **boundary layers** (Grenzflaeche) of different media.

II. Department of Wave Propagation and High Frequency Technology, headed by Professor Richard Schachenmeier, who is assisted by the Director of the Institute Professor Otto Hachenberg. About 35 scientists and technicians work in the Department. Dr. Rudolf Schuenemann, formerly with Department I, is now working in Department II. The Department is engaged in the study of wave propagation. 2/

III. Department of Highest Frequency, headed by Dr. Helmut Jung, assisted by Dr. Mollwo (fnu) and Dr. **Willi Praxmarer**. It is engaged in decimeter and centimeter wave research and technology. Main emphasis is now placed on the generation of waves in the indicated length range, construction and study of receivers for this range, measurement of absolute energy and application in the field of molecular spectroscopy. The Department has a klystron of three centimeters and 25 milliwatt from the HF works in Oberschoeneweide. In about June 1953 the Department, which had not previously engaged in tube construction, started to do so; no tubes have been completed yet.

IV. Department of Electronics and Television, headed by Institute Director Otto Hachenberg after the defection to West Berlin of the former head of the department Dr. Heinz Mittke. 3/ The Department is engaged in theoretical and experimental work in the field of electron optics and the study of photo-electrical layers and of phosphorescence caused by electrons. It is also engaged in the development of iconoscopes and super-iconoscopes amplifying five to ten times and in the development of vidicon valves using the interior photo-electric effect. Dr. Eckert (fnu), a former technician of the Oberspree works now with the Institute for Research on the Physics of Solids in Berlin-Buch, works with this department on a part-time basis.

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V. Department of Magnetic and Di-Electric Material Testing, headed by Dr. Johannes Jeschke. It is mainly engaged in the development of special magnetites.

VI. Department of Theoretical Electrotechnics 4/, headed by Blankenfeld (fnu), [redacted] who was given this position after the defection in early 1953 of the former Department head, Dr. Hagen (fnu). 50X1-HUM Blankenfeld is assisted by Institute Director Hachenberg. The Department is engaged in theoretical study of impulse technology and in what is called there "economy of transmissions", which concerns the problem of how many signals can be transmitted through a channel of given width.

2. Every one of the listed departments has from one to four laboratories. The Institute now has a total of 124 technicians.

3. Work on ionospheric propagation carried out by Department II does not include any research projects on forward-scatter and back-scatter propagation. 5/

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4. Work carried out by Department II on tropospheric propagation concerns the propagation [redacted] waves in the one to ten-meter range well beyond the horizon, in its dependency upon refraction in the troposphere. The theoretical part of this work is based on ideas of Professor Schachenmeier, published in Archiv fuer Elektrische Uebertragung 6/, whereby the field intensity is computed from six main values: the gradients of pressure, humidity and temperature and the values of pressure, humidity and temperature on the surface of the earth. The problem involved lies in the determination of the weight of each of these factors in the computing of the field intensity. Institute personnel believe that their experiments have borne out well Schachenmeier's theories. Two experimental projects are the basis for the study of wave propagation in its dependency upon tropospheric conditions:

a. In about August 1952, the Institute established a measuring section (Messstrecke) of about 60 kilometers length leading from Karow (Mecklenburg) to the Institute Field Laboratory (Aussenstelle) in Neustrelitz; this line traverses the Mecklenburg lake region. The transmitter located in Karow sends out constant transmissions of 42 MHz frequency, which are received in Neustrelitz. Recording of the arriving field intensities has not provided satisfactory results when compared with theoretical values arrived at by using the values of pressure, humidity and temperature gradients furnished by the Rostock Meteorological Station. Since this station is at a distance of more than 50 kilometers from the Messtrecke line, it is believed that the deviations are accounted for by the difference of tropospheric gradients in Rostock from those on the line. For this reason the Institute established another project for a Messtrecke line passing directly over an area with a meteorological station.

b. This Messtrecke was supposed to be put into operation in the early summer of 1953, but it had not been definitely established by mid-August 1953. The line will lead from a 200-watt transmitter located at the Heinrich-Hertz Institute to a place near Guben, passing directly over Lindenberg. The Lindenberg Meteorological Institute will provide the necessary data on pressure, humidity and temperature gradients. 7/ Since the establishment of the receiving station has been delayed beyond the original schedule, preliminary experiments were carried out with a "flying receiver", i.e., with a receiver mounted on a measurement car which was sent to the Guben region and received the transmissions from the Institute over a period of two months. The results were satisfactory and are regarded as a confirmation of Schachenmeier's theory. A comparison of the values of field intensity computed theoretically on the basis of the Lindenberg tropospheric gradients with those obtained from the Guben receptions showed a correlation coefficient of the two curves of 70. It is expected that the site of the receiving station can be selected in the near future. The completed line will have a length between 80 and 100 kilometers; the Institute transmitter will send out transmissions of 42 and 62 MHz every two hours. The purpose of this Messtrecke is to collect data over a period of years and to establish monthly curves of values received every two hours.

5. While Department II is very much interested in the phenomenon of super-refraction, it has not carried out any large scale research project pertaining to it. The activity of the department in this field is confined to receiving with standardized receivers radio and television transmissions from far-off stations, mainly from Russia and England. Tests for the occurrence of such transmissions are made every two hours at the Neustrelitz Field Laboratory. The field intensities of all arriving transmissions are recorded. A record is also kept of the percentage of receptions from very distant stations in relation to the period of time during which they occur. The aim of the Department relative to the problem of super-refraction is to collect enough data to be able to advance a reasonable theory about the conditions under which super-refraction occurs. The data collected so far, however, are not sufficient to make a definite statement, but Department personnel believe that the data now available permit the conclusion that super-refraction takes place along inversion layers of the atmosphere. The least which can be said with certainty is that there has always been inversion in the Neustrelitz atmosphere whenever super-refraction was recorded.

6. Neither Department II nor any other Institute department is engaged in research on refraction of waves over the terrain (Bodenwellen).

7. In addition to what has already been said about the work of Department IV (para 1), it is noteworthy that its personnel believe they have made progress in research and development concerning semi-conductors. The Department has been engaged exclusively in the study of cesium-antimony alloy layers on glass. The following problems concerning the physics of such layers have been solved:

a. Measurement of the distance between the conductivity band (Leitfaehigkeitsband) and the electron-filled band

b. Measurement of the distance of the exit potential (Austrittsarbeit) from the lower edge of the conductivity band

c. Investigation of the infra-red band of cesium-antimony alloys

8. While the Institute is very much interested in the questions of printer circuits and of miniaturization of electronic components, no research bearing on these questions is carried out nor is special emphasis placed on them.

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9. To a certain degree, there is permanent cooperation between the Heinrich-Hertz Institute and similar institutes [redacted] The Heinrich-Hertz Institute sends its publications and data sheets on ionospheric and tropospheric research to the French Inorheric Station SHPT in Freiburg, South Germany, to the Max-Planck Institute for Ionospheric Research in Lindau (Bodensee), to the Observatory on the Schauinsland mountain near Freiburg, [redacted] 50X1-HUM
In return, the Heinrich-Hertz Institute receives publications, including special publications, of these institutes. These institutes also make available to the Heinrich-Hertz Institute their measurement data (Messreihen). The West German Bundespost provides the Heinrich-Hertz Institute with its daily ionosphere telegram. 8/

10. There is no real cooperation between the Heinrich-Hertz Institute and Russian or satellite institutes. No contact exists between the Institute and Soviet or satellite scientists. Judging from appearances, the Russians have lost interest in the ionospheric and tropospheric research of the Institute, though they seemed to be much interested in it in the beginning. Russian visitors, including Academy liaison officer Cherkesov, used to come to the Institute rather frequently; their visits have almost entirely stopped during the last few months. Several months ago Cherkesov requested written reports on the Institute's research work; these reports have not been picked up yet. On the other hand, it must be borne in mind that all reports of the Institute are available to the Russians directly through the East German Academy of Sciences, where these reports are forwarded. Several requests made by the Institute through the East German Foreign Ministry and the Soviet Control Council for better cooperation from Russia and for direct contact with the Russian experts in the field were ignored. It is known at the Institute, however, that the Russians are engaged in ionospheric research, because they received an ionosphere transmitter from the Scientific-Technical Office for Device Construction (Wissenschaftlich-Technisches Buero fuer Geraetebau) of SAG Kabel. In the summer of 1952 the Poles requested the Institute to construct an ionosphere transmitter for Poland. The Institute rejected the order on the grounds that there was not enough laboratory space available. The Poles then procured the blueprints and all pertinent documentary material from the Academy of Sciences. Subsequently, the Institute asked the Poles for an exchange of scientific information. The Poles promised to comply but never did. Thus, the scientific cooperation between the Institute and Eastern States can at best be termed unilateral, with the Institute supplying information but receiving none.

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1/ Comment. Some of the information in this paragraph concerning the internal structure of the Institute and its work is not contained in the 1950/51 Year Book of the Academy of Sciences.

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3/ Comment. Wittke defected to the Nera Radio Firm, West Berlin, in the spring of 1953.

4/ Comment. This department is not listed in the Academy Year Book.

5/ 50X1-HUM

6/ Comment. Believed to be published by the Central Research Institute of the West German Post in Darmstadt.

7/ 50X1-HUM

8/ Comment. Some time ago, the East German Post requested the Institute to make the telegram available to 50X1-HUM the East German Post. The Institute answered that the consent of Post had to be obtained first 50X1-HUM and the Institute applied for it. No answer has been received. It is of interest to note that Post is obviously unaware of the fact that ionosphere telegram is broadcast daily by a transmitter. 50X1-HUM